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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,910	07/12/2006	Sture Helmersson	1026-0007WOUS	1390

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MICHAUD-DUFFY GROUP LLP  
306 INDUSTRIAL PARK ROAD  
SUITE 206  
MIDDLETOWN, CT 06457

EXAMINER
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PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3663

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09/17/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/585,910	<b>Applicant(s)</b> HELMERSSON ET AL.	
	<b>Examiner</b> Rick Palabrica	<b>Art Unit</b> 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 25,27-30 and 33-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 25,27-30 and 33-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/22/09 has been entered.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 25, 27-30, and 33-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 25 and 48 recite the limitation, "each sleeve being manufactured in a sheet-shaped material". As presently set forth, the limitation means that the sleeve is

Art Unit: 3663

produced internal to, within, or inside a sheet-shaped material. There is neither an adequate description nor enabling disclosure for such sleeve being so internally manufactured in the starting material (see paragraphs 0019 and 0020 of the specification).

3. Claims 25, 27-30, and 33-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and incomplete and their metes and bounds cannot be determined because the claims are inconsistent with the specification (see also section 2 above).

Regarding claims 35 and 38, the terms, "sleeve-like" and "wave-like", respectively, render the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim 28 recites the limitation "one of said long sides" in line 2. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

Art Unit: 3663

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 25, 27, 33-38, 40-44, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Kanno et al. (U.S. 5,225,154) alone or Helmersson (U.S. 6,415,011) in view of Feutrel (U.S. 4,594,216),

Kanno et al.

As to claims 25 and 48, Kanno et al. teach a plurality of spacers (2) for holding a number of fuel rods (1) intended to be located in a nuclear power plant (e.g., see Figs. 1-4). The spacers are made from a cold-rolled sheet (see col. 9, lines 58+).

Applicant's claim language reads on Kanno et al. as follows: a) "sleeve forming a single cell" reads on the combination of spacer bars 21 and spacer band 22 (see Fig. 4a); b) "first end" reads on the end 22 (see Fig. 4B); c) "second end" reads on end 24 (see Fig. 48). As to the limitation "first end overlapping the second end" see Fig. 4B showing an overlap between an end of element 22 and element 24, and the connection between these ends is by means of at least one weld joint (see col. 1, lines 32+).

As to the claimed material thickness, this is a matter of design and/or optimization. The sleeve must be designed to provide adequate structural support to the fuel rods (having physical attributes, e.g., dimensions, fuel type, etc.) and under normal and abnormal reactor conditions (e.g., flow, temperature, and pressure), which physical attributes and reactor conditions are not defined. Absent such definition, the examiner interprets these physical attributes and reactor conditions broadly, and reads them on any and all such attributes and conditions where Kanno et al.'s spacer can be appropriately applied.

Additionally, the spacer thickness is matter of optimization that includes a proper balancing of competing factors, e.g., a thicker spacer provides stronger structural support for the fuel rods but results in higher parasitic neutron capture than a thinner spacer. As to matters of optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A).

MPEP 2144.05.II (Optimization) requires that a particular parameter be recognized as a result-effective variable, i.e., a variable which achieves a recognized result. The thickness of the spacer is clearly a result effective variable, which achieves varying degrees of benefits, as it is varied. Different thicknesses result in different parasitic neutron captures and different structural strengths, but largely predictably.

Also, the limitation regarding the manner of manufacturing the sleeve is a product-by-process limitation that is met by the applied art. MPEP 2113 states:

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777F.2d 695, 698, 227 USPQ 964, 966.

As to claim 27, see Fig. 4B in Kanno et al.

As to claim 33, see above discussion of spacer thickness in claim 25.

As to claim 34, the sleeve of Kanno et al. has an upper edge and lower edge (see Fig. 4).

As to claims 35 and 36, applicant’s claim language, “ridges”, reads on the springs and dimples that extend from the upper edge to the lower edge of Kanno et al.’s spacer (see Fig. 4B).

Art Unit: 3663

As to claim 37, the number of ridges is a matter of design and/or optimization. For example, more ridges result in better support for the rods but higher parasitic neutron captures (see also above discussion on spacer thickness).

As to claim 38, see Fig. 4B in Kanno et al.

As to claims 40, 41 and 42, see Fig. 4B in Kanno et al. showing the sleeves abutting each other at lattice points 23 between the wave valley of the upper edge and the lower edge of spacer bar 21. As to connection by weld joints, see col. 1, lines 33+.

As to claim 43 and 44, and the four orthogonal sides, see Fig. 4A in Kanno et al.

The claims are replete with statements that are either essentially method limitations or statements of intended or desired use. For example, “for holding a number of elongated fuel rods intended to be located in a nuclear plant”, etc. These clauses, as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does.” Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The system in the cited reference is capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited references.

Helmersson – Fuetrel combination

As to claims 25 and 48, Helmersson teaches a plurality of spacers (14) for holding a number of fuel rods (12) intended to be located in a nuclear power plant (e.g., see Figs. 1-7).

Applicant's claim language reads on Helmersson as follows: a) "sleeve forming a single cell" reads on cells 16 (see Fig. 2a). The spacer cells are made from metal sheets (see col. 7, lines 43+). Helmersson does not specifically teach how the sleeves are fabricated from the metal sheets.

Feutrel teaches forming cylindrical sleeves from sheet metal by either contacting vertically the lateral ends of a sheet and joining them with a vertical welding bead (see Fig. 5 and col. 5, lines 39+) or by overlapping two vertical ends and joining them by a vertical bead of welding spots (see Fig. 3 and col. 4, lines 49+).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to produce the sleeves in the apparatus, as disclosed by Helmersson, by the teaching in Feutrel, by forming a sleeve from a sheet-shaped material, overlapping a first end to a second end, and joining them by means of at least one weld point, to gain the advantages thereof (i.e., greater flexibility on the



Art Unit: 3663

configuration of the cell), because such modification is no more than the use of a well known expedient within the nuclear art.

Alternatively, the claims would have been obvious because a person of ordinary skill has good reason to pursue the known options of forming the sleeve within his or her technical grasp, particularly in the light of the teachings in Feutrel. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

As to claim 34, the sleeve/cell 16 of Helmersson has an upper edge and lower edge (see Fig. 2a).

As to claims 35 and 36, the sleeve/cell 16 of Helmersson includes a number of ridges that extend from the upper edge to the lower edge (see Fig. 2a).

As to claim 37, Helmersson teaches four ridges (see Fig. a).

As to claim 38 and the wave peaks and wave valleys in the upper and lower edges of the spacer, see Fig. 2a.

As to claims 40, 41 and 42, see Fig. 2a in Helmersson showing the sleeves abutting each other along a connection area parallel to the longitudinal axis between a wave valley of the upper edged and a wave valley of a lower edge. As to connection by weld joints, see col. 5, lines 33+.

As to claim 43 and 44, and the four orthogonal sides, see Fig. 2a.

5. Claims 28-30 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Helmersson in view of Feutrel.

As to claim 28, Helmersson teaches a spacer with vanes to achieve improved coolant deflection toward the fuel rods while minimizing unwanted turbulence (see col. 2, lines 33+).

As to claim 29, see the embodiment shown in Fig. 3, which can be applied to the cells shown in Fig. 2a (see col. 5, lines 42+). The claim recites the limitation “extends” broadly and therefore includes both “directly extends” and “indirectly extends.” Any vane configuration in the above applied art directly or indirectly extends from the first connection portion.

As to claim 30, see col. 2, lines 42+.

As to claim 45, absent the definition of the term, “long side”, which term also has no antecedent basis in the claims, the examiner interprets the term broadly and reads it on any all sides of the spacer from which the vane in Helmersson extends.

6. Claims 28-30 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al., as applied to claims 25, 27, 33-38, 40-44, and 48 above, and further in view of either one of Matzner (U.S. 5,416,812) or Taleyarkhan (U.S. 4,698,204).

Kanno et al. disclose the applicant’s claim limitations except for the vane.

As to claim 28, either one of Matzner or Taleyarkhan teaches that it is old and advantageous to have a mixing vane in a boiling water reactor to increase the critical power limit (see Figs. 4-7 and col. 3, lines 50+ in Matzner or Figs. 6-9 and col. 2, lines 30+ in Taleyarkhan).

Art Unit: 3663

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Kanno et al. , to include a vane to gain the advantages thereof (i.e., improve heat transfer characteristics of the system), because such modification is no more than the use of conventional designs/techniques within the nuclear art.

As to claims 29 and 30, see Fig. 5 in Matzner or Fig. 7 in Taleyarkhan.

As to claim 45, absent the definition of the term, "long side", the examiner interprets the term broadly and reads it on any all sides of the spacer from which the vane in the above applied art extends.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References E and F further illustrate prior art.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3663

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rick Palabrica/  
Primary Examiner, Art Unit 3663

September 9, 2009